IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

Atsushi Yamamoto et al. Group Art Unit: **1744**

Serial No.: **09/674,931** Examiner: **Shay L. Balsis**

Filed: **November 8, 2000**

For: **Toothbrush**

DECLARATION UNDER 1.132

Mail Stop Non-Fee Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

January 11, 2005

Sir:

Supplemental to the Amendment filed on December 9, 2004, enclosed is the signed Declaration Under 1.132.

In the event that any fees are due in connection with this paper, please charge our Deposit Account No. 01-2340.

Respectfully submitted,

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DECLARATION UNDER RULE 1.132

As one of the inventors, I hereby declare that the following described experimentation was carried out as indicated.

Name of the Inventor: Atsushi Yamamoto

Inventor's Signature: Atsushi Yamamoto

Residence: 2-10-1, Kamihamuro, Takatsuki-shi, Osaka 569-1044 Japan

Citizenship: Japanese

1. Date of experimentation

From November 25 to 26, 2004

2. Place of experimentation

At a Mechanical Laboratory of Product Research and Development Division of SUNSTAR INC. having an address of 3-1, Asahimachi, Takatsuki-shi, Osaka 569-1195 Japan.

3. Experimenter

The experimenter's name is Atsushi YAMAMOTO, who is the first inventor of the present invention and now belongs to the above-mentioned Mechanical Laboratory of Product Research and Development Division. He was born in 1969 and he graduated from Kyoto Institute of Technology. His background is in molding engineering.

He joined Sunstar Inc. (an Assignee of the present patent application) in 1994. Since he has joined the company, he has been continuously taking charge of developing toothbrushes, e.g. "Do Power" (1996), "Ora 2" (1999), "Do Clear W" (1999), "Butler for children" (2002), "Do Standard" (2004), and so on. Good Design Prize has been given to "Ora 2" and "Butler for Children". "Do Clear W" is a product of the present invention.

4. Purpose of experimentation

The purpose of the experimentation was to clarify a difference of brushing effect between toothbrushes of the cited references and those of the present invention.

5. Content of experimentation

a) Method of experimentation

Sample toothbrushes 1 to 5 as described in the following Table 1 were prepared and cleaning performance of each toothbrush was evaluated after brushing a jaw model set on a brushing simulator.

The shape of tufting holes of samples 1 to 4 is circular. But the shape of tufting holes of sample 5 is elliptic, wherein a lengthwise direction of the tufting holes is along the direction of the handle length. The shape of tufting holes of sample 5 is similar to that of the present invention.

The tufting holes of samples 1 and 2 are not inclined. But the tufting holes of samples 3 and 4 are inclined by 6 degrees, in directions perpendicular to lengthwise directions of the handle length, toward a tufting surface so as to have tufts implanted therein support one another.

The end portion of each tuft of samples 1 and 3 is a flat shape and that of samples 2, 4 and 5 is a chisel shape.

(Table 1)

	Shape of tufting holes	Inclined angle of tufting holes	Shape of end portion of tuft
Toothbrush 1	Circular	0°	Flat shape
Toothbrush 2	Circular	0°	Chisel shape
Toothbrush 3	Circular	6°	Flat shape
Toothbrush 4	Circular	6°	Chisel shape
Toothbrush 5	Elliptic	6°	Chisel shape

b) Steps of experimentation

Step 1

A toothbrush and a jaw model were set on a brushing simulator. The toothbrush was provided at the neck portion with a warp gage (manufactured by Kyowa Dengyo company, type KFG-2-350-C1-11L1M2R) in order to control a brushing pressure.

Step 2

First, a spray for checking for dental occlusion (brand name "Occlude," Pascal Co., Ltd.) was applied to the jaw model as a sample stain and then the buccal surface of the left side first molar of the jaw model was brushed using the sample toothbrush and a brushing simulator. The brushing conditions are described in the following Table 2.

(Table 2)

Items	Conditions
Way of brushing	Brushing in an almost horizontal direction
Evaluated portion	Buccal surface of the upper left first molar
Brushing pressure	100 g
Brushing time	2.5 sec
Strokes	10 mm
Back and forth times	8 times

Step 3

After brushing under the above-mentioned conditions, the jaw model was changed to a new one without changing the toothbrush.

Step 4

The above-mentioned Steps 1 to 3 were repeated three times each.

Step 5

After all the brushing, the evaluated portion of the jaw model was photographed by using a camera manufactured by Nikon (COOLPIX 4500).

Step 6

The photographed image was analyzed by using "Photo Shop" of Adobe Company and "NIH Image" of US National Institutes of Health so that stain removing rate (cleaning performance) was calculated. The ratio was calculated by the following Formula (1).

Stain removing ratio (%) = [(area of whole teeth) - (area of being stained) / (area of whole teeth)] x 100 . . . . . Formula (1)

6. Results of experimentation

The stain removing ratio of each sample toothbrush obtained by the above mentioned experimentations are described in the following Table 3. Toothbrush 5 is similar to that of the present invention.

(Table 3)

	Stain Removing Ratio (%)			
	1st time	2nd time	3rd time	Average
Toothbrush 1	79.1	83.4	82.9	81.8
Toothbrush 2	83.4	80.2	63.7	75.7
Toothbrush 3	77.1	89.5	86.3	84.3
Toothbrush 4	90.2	80.6	88.5	86.4
Toothbrush 5	91.6	90.8	85.1	89.2

7. Evaluation

a) Cleaning performance due to an inclination of tufting holes

This performance was evaluated by comparing the stain removing ratio of each toothbrush having a same shape of end portion of the tuft and a different inclined angle of the tufting holes, i.e. toothbrushes 1 and 3, and toothbrushes 2 and 4.

As shown in the above-mentioned Table 3, the stain removing ratio of toothbrush 1 having no inclined angle of tufting holes is 81.8% in average, but that of toothbrush 3

having an inclined angle of tufting holes is 84.3% in average. This shows that the inclination of tufting holes improves the cleaning performance.

In addition, the stain removing ratio of toothbrush 2 having no inclined angle of tufting holes is 75.7% in average, but that of toothbrush 4 having an inclined angle of tufting holes is 86.4% in average. This shows also that the inclination of tufting holes improves the cleaning performance.

b) Cleaning performance due to an elliptic shape in addition to an inclination of tufting holes

This performance was evaluated by comparing the stain removing ratio of each toothbrush having a same inclined angle of tufting holes and a different shape of tufting holes, i.e. toothbrushes 4 and 5.

As shown in the above mentioned Table 3, the stain removing ratio of toothbrush 4 having a circular shape of tufting holes is 86.4% in average but that of toothbrush 5 having an elliptic shape of tufting holes is 89.2% in average. This shows that the elliptic shape of tufting holes improves the cleaning performance.

The undersigned declares that all statements made herein of his/her own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under § 1001 of Title 18 of the United States Code and that willful false statements may jeopardize the validity of the application or any patent issued thereon.

Signed on this 29th day of December, 2004

Atsushi Yamamoto

Atsushi YAMAMOTO